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connection with such an American exposition would interest the people more, and no other would be more instructive; and it is proposed or suggested by the Citizens' Committee that a great archæologic exhibit be made, and that each nation in North, Central, and South America be invited to contribute its quota to this great museum. The erection of an appropriate building for this purpose, indestructible by fire, and of sufficient magnitude for the instalment of so great a collection, would cost about five hundred thousand dollars. The archæologic materials to be found within the territory of the United States are in part, but only in small part, collected, and now in the National Museum; and the time is all too short for the completion of this collection, yet by beginning soon it might be well done.

"Such, in brief, is the plan which I was requested to present to you by the Citizens' Committee. It is no less than to collect and put on record for future generations the priceless records that constitute the history of all the native American races. If this can be done, it will be a monument to these native peoples, erected by the invading and conquering and civilizing nations, worthy of Aryan power, and worthy of Aryan culture."

WHEAT-CULTIVATION.

IN the last number of the Journal of the Royal Agricultural Society of England, the most interesting sections are those bearing upon wheat-cultivation. A paper upon the condition of wheat-growing in India, by Dr. George Watt, is followed by an article by Mr. W. E. Bear upon the Indian wheat trade, and in this connection is given an interesting account of modern improvements in corn-milling machinery. These papers throw considerable light upon the difficulties under which the English wheat-grower is struggling, and are commented on by Mr. Wrightington in a recent number of *Nature*.

Dr. Watt and Mr. Bear show the extraordinary extent of the wheat-producing area of the Indian Empire, and the rapidity with which this vast field is being opened up. With reference to the latter point, men in middle life are scarcely likely to realize the fact that in 1853 there were in all only 20½ miles of railway in India, that in 1873 there were 5,695 miles of railway, while in 1887 there were 13,386 miles. Telegraphic communication with India was first opened in 1865, and the opening of the Suez Canal in 1869 was scarcely of less importance in developing her trade, first by shortening the passage, and second by mitigating the risk from wheat-weevil. Another agency has been the development of irrigation-works. We read that "only" 30,000,000 acres have up to date been artificially irrigated; but the appropriateness of the qualifying adverb is rendered evident when it is employed in contrast with the total area of 200,000,000 acres of cultivated ground, and the vast tract of 868,314 square miles which include British India. The normal area under wheat is 26,000,000 acres, and the degree to which this area is likely to be increased depends entirely upon demand and price. Dr. Watt informs us that the Indian cultivator is at all times ready to adapt his courses of cropping to circumstances, and that he will increase or abandon the cultivation of wheat, cotton, or any other crop according to its comparative profitability.

Dr. Watt comes to the conclusion that the Indian wheat trade up to the present time is a perfectly natural one. "The people are exporting only what they specially cultivate for that purpose. The moment better profits can be realized on another crop, they will turn from wheat, without being in the least degree incommoded." If this is the case, the English farmer may well look with envy upon his Indian brother, as he is in the unfortunate position of being compelled to carry on wheat-growing from sheer inability to find a substitute for it in his agricultural economy. Natural though the course of the ryot may be from his point of view, the actual bounty upon wheat, or what amounts to a bounty, consequent upon the fall in value of the rupee, can scarcely be described as natural. This great advantage to the Indian cultivator is clearly brought out by Mr. Bear by the following considerations: First, the Indian ryot gets as much for a quarter of his wheat now as he obtained in 1872. He gets as many rupees, and his rupees are worth as much to him as they were then. In 1871-72 the average exchange value of the

rupee was 1s. 11.12d., whereas recently it has been under 1s. 5d. The price of No. 2 club wheat in Calcutta in 1872 averaged only 2rs. 3s. 1p. per maund, whereas it has for some time past been over 2rs. 10s. Taking 16rs. per quarter (6 maunds) as the price for both periods, then reckoning the exchange value of the rupee for both periods, it is clear that the exchange value of 16rs. in 1872 was equal to 30s. 8d. per quarter, whereas the exchange value of the same sum in 1888 is only 22s. 8d. The fact is that the Indian ryot gets as much for a quarter of wheat now as he did in 1872, in spite of the fall in prices. He gets as many rupees, and his rupees are worth as much to him. This seems to settle the question as to the encouragement given to the ryot as a competitor in wheat-growing with the English farmer. Another point, in all respects discouraging to the cultivation of wheat in England, is found in the complete revolution during the last ten years in corn-milling machinery described by Mr. W. Proctor Baker of Bristol. There has been, in fact, not a mere substitution of one machine for another, or of one series of machines for another, but there has been a change of the principle and mode of procedure. The old system of 'low grinding' by mill-stones, so well calculated for producing flour from soft, tender wheats, such as are produced in England, has been entirely superseded by the Hungarian and American 'gradual reduction' process by 'roller mills.' Not only does this system require the wheat to be dry, hard, and brittle, so as to secure the requisite cracking and gradual reduction, but any thing in the form of a soft or moist wheat is most injurious to the machinery and the products. It rolls into a paste, steam is generated, and the flour works into balls, becomes attached to the rollers, turns sour, and, in fact, throws the entire process out of gear. "It is because of these troubles that owners of mills on a large scale will not employ native wheats in damp seasons. No concession of price is sufficient inducement to them to risk the disorganization of the mill, and probable loss of reputation, by turning out inferior or irregular flour." There are, however, two modes in which these wheats may be used,—first, by submitting them to an artificial drying process; and, second, by mixing them with some description of very brittle wheat, and allowing the mixture to lie for some weeks, until the brittle wheat absorbs some of the moisture of the native wheat, to the mutual advantage of both.

THE MARINE BIOLOGICAL LABORATORY.

THE new laboratory is at Wood's Holl, Mass. A convenient site has been secured close to the shore and to the laboratories of the United States Fish Commission. The laboratory building consists of two stories; the lower story for the use of students receiving instruction, the upper story exclusively for investigators. The laboratory will have boats, dredges, and other collecting apparatus; it will also be supplied with running sea-water, with alcohol and other re-agents, glassware, microtomes, aquaria, etc., a limited number of microscopes for students' use, and a small reference library.

Dr. C. O. Whitman, the distinguished embryologist, has accepted the directorship; and Mr. B. H. Van Vleck, who has had greater experience than any one else in this country in the management of summer seaside biological schools, has been appointed instructor. Under these very competent officers, the laboratory will attract probably more persons than can find accommodation; nevertheless it remains a matter of regret that the announcement of the opening of the laboratory has been so much delayed, owing, we understand, to some unavoidable difficulties in completing the preliminary arrangements.

The laboratory for students will be opened on Tuesday, July 17, at 9 A.M., for a systematic course of six weeks in zoölogy. By permission of the director, students may continue their work until Sept. 20 without additional payment. Microscopes, glass-ware, etc., will be supplied without extra charge except for breakage. Hand lenses, dissecting instruments, drawing materials, etc., may be bought at cost in the laboratory. It is desired that students owning microscopes should bring them.

The fee for this course is twenty-five dollars. The number of students will be limited to twenty-five.

The laboratory for investigators will be opened on July 10, and

will be closed on Sept. 22. It will be equipped as fully as the means permit. Microscopes will not be provided, but it is believed that investigators will find most of their indispensable wants satisfied. The fee for an investigator's table will be fifty dollars for the present season.

Rooms accommodating two persons may be obtained near the laboratory at prices varying from three to four dollars a week, and board from four and a half to seven dollars. Applications for places in the laboratory should be made immediately to the secretary of the Marine Biological Laboratory, Nahant, Mass.

Wood's Holl, owing to the richness of the marine life in the neighboring waters, offers exceptional advantages. It is situated on the north shore of Vineyard Sound, at the entrance to Buzzard's Bay, and may be reached by the Old Colony Railroad (two hours and a half from Boston), or by rail and boat from Fall River and New Bedford.

The new laboratory is intended to continue and extend the work of the laboratory at Annisquam, carried on for six years by the Woman's Education Association, with the co-operation of the Boston Society of Natural History.

SCIENTIFIC NEWS IN WASHINGTON.

A New Building in the National Museum; more than Twelve Thousand Accessions made to the Museum since 1882, and nearly Seven and One-Half Million New Entries made in its Catalogues; Hundreds of Thousands of Interesting Specimens yet unpacked; Exhibits for which there is not even Storage-Room.—How the Cholera was spread in Japan in 1886.—The Proper Treatment of Inebriety as a Disease.—More about the Proposed Vacuum Air-Ship.

The Proposed New Building for the National Museum.

THE Senate Committee on the Library has reported favorably a bill to provide for the erection of an additional fire-proof building for the use of the National Museum. The appropriation made for this purpose is \$500,000, and the new building is to cover an area of 300 feet square, and to consist of two stories and basement. The site of the building is to be to the west of the Smithsonian Institution, flanking it on that side as the present building does upon the east. The present building contains about 80,000 square feet of floor-space available for exhibition and storage. The building proposed will contain about 220,000 square feet. The amount of room for offices and laboratories will be about the same in each. The net area in the new building available for exhibitions, storage, and office-rooms, as estimated, will be between five and six acres.

The cost of the present National Museum building was \$315,400, and that cost was less than that of any similar building in existence in this country. The proposed structure can now be erected at proportionately smaller cost, responsible builders having offered to build it for \$473,000. Plans of the interior and elevations of the proposed new building were submitted with the report of the committee.

To show the necessity of providing at once more extensive accommodations for the National Museum, the following interesting extracts from a letter written to the committee by Prof. S. P. Langley, secretary of the Smithsonian Institution, June 7, are given:—

"Since the erection of the present museum building there have been more than 12,000 accessions to the collections, chiefly by gifts. From the year 1859 to 1880 the accessions numbered 8,475. It is thus evident that within the last eight years the number of accessions has been half as large again as during the previous twenty-one.

"Many of the more recent accessions are of very great extent, as, for instance, the bequest of the late Isaac Lea of Philadelphia, which contains 20,000 specimens of shells, besides minerals and other objects; the Jeffries collection of fossil and recent shells of Europe, including 40,000 specimens; the Stearns collection of mollusks, numbering 100,000 specimens; the Riley collection of insects, containing 150,000 specimens; the Catlin collection of Indian paintings, about 500 in number; the collection of the American Institute of Mining Engineers, for the transportation of which to Washington several freight-cars were required.

"There are also the extensive collections obtained at the Fisheries Exhibitions at Berlin and London and at the close of the New Orleans Cotton Centennial; the Shepard collection of meteorites; the Wilson collection of archæological objects (more than 12,000 specimens); the Lorillard collection of Central American antiquities; and very many others nearly as extensive. In addition to these are the annual accretions from the work of the United States Fish Commission, the United States Geological Survey, and the Bureau of Ethnology, as well as the contributions from several expeditions of the government, from army and navy officers, and from other government officials. These are very extensive, and are yearly increasing in bulk and value.

"In the Armory Building are stored many hundreds of boxes of valuable material which we have not room to unpack, and the great vaults under the Smithsonian building and many of the attic and tower rooms are similarly occupied.

"For several important departments of the museum no exhibition space whatever is available, and no portion of the collection can be publicly displayed. Indeed, the growth of many of the departments is in large measure prevented by the fact that we have no room for additional exhibition-cases, or even for storage. Many valuable collections elsewhere than in Washington are at the service of the museum, but we have no space for their reception.

"At the close of the last fiscal year (June 30, 1887) a very careful estimate showed that the collections were sixteen times as great in number of specimens as in the year 1882.

"The museum is growing, as it is fitting that the national museum of a great country should grow; and it is not only necessary to care for what is already here, but to provide for the reception and display of what is certain to be placed in our hands within the next few years.

"The present museum building is not more than large enough for the ethnological and technological material already available. The proposed new building will afford accommodation for the natural-history collections, which are at present very inadequately housed. For instance, the amount of space assigned to the collection of mammals is about 6,500 feet. At least double that amount of space will be needed to accommodate the material now on hand as soon as the taxidermists of the museum shall have been able to prepare it for exhibition, it being our desire to have mounted groups, similar to the buffalo family recently finished, in order to preserve for future generations representations of the large quadrupeds native to this continent, which are on the verge of extinction.

"The collection of birds, which, so far as North America is concerned, is the finest in the world, is very inadequately shown, and requires double the case-room now available.

"The collection of mollusks, which is one of the most complete in the world, and contains more than 450,000 specimens, is at present almost entirely unprovided for.

"The collection of insects, which, though smaller, is, so far as North America is concerned, equally perfect, is also practically without any exhibition space. And so I might continue.

"It should be borne in mind that under the roofs of the Smithsonian and new museum buildings are grouped together collections which in London, Paris, or any other of the European capitals, are provided for in a group of museums, for the accommodation of which a much larger number of equally commodious buildings is found useful."

Causes of the Cholera Epidemic in Japan in 1886.

The *Marine Hospital Abstract of Sanitary Reports* for last Saturday contains extracts from a Japanese official publication on the cholera in that country in 1886. It spread over the whole empire, there being 155,574 cases, among which 110,086 were fatal. There were only seventeen days in the whole year in which no cases were reported. The following paragraphs from this report are interesting, because they show, what has been so often shown before, the effect of bad sanitary conditions upon the spread of an epidemic:—

"As to the cause of its outbreak and propagation, accurate evidence is wanting; it is an undeniable fact, however, that it sprang and was propagated from the widely spread germs of the disease